

WHAT IS CLAIMED IS:

1. A method of deciding Internet address of a device to be specified in network connecting a plurality of devices that communicate each other by using an Internet Protocol,
5 the method comprising the steps of:

detecting and collecting addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network; and

selecting an IP address, which is different from the
10 collected addresses, from among a group of applicable IP addresses.

2. The method according to claim 1, further comprising the steps of:

15 checking whether the selected IP address matches with the IP address of any of said other devices; and

if the selected IP address matches with the IP address of any of said other devices, repeating the step of selection of the IP address until the selected IP address does not
20 match with the IP address of any of said other devices.

3. A method of deciding Internet address of a device to be specified in network connecting a plurality of devices that communicate each another by using an Internet Protocol,
25 the method comprising the steps of:

detecting addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network;

5 selecting an IP address and a MAC address among the detected addresses to pose as a device having the IP address and the MAC address;

10 sending a destination signal on the network by using the address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

selecting an IP address, which is different from the collected addresses, among a group of applicable IP addresses.

15 4. The method according to claim 3, which comprises collecting complete address information by selecting an IP address and a MAC address other than the IP address and the MAC address of the posed device for any device that does not respond, changing the posed device until all the devices
20 are posed, and performing the step of sending the destination signal for each of the posed devices.

5. The method according to claim 3, further comprising the steps of:

25 checking whether the selected IP address matches with

the IP address of any of said other devices; and

if the selected IP address matches with the IP address of any of said other devices, repeating the step of selection of the IP address until the selected IP address does not
5 match with the IP address of any of said other devices.

6. A method of selecting an IP address that does not overlap with other addresses among the effective range permitted as IP address, the method comprises the steps of:

10 detecting and collecting addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network;

sectioning binary numerals of the collected IP address at Nth bit ($1 \leq N \leq K$, K is a predetermined natural number)
15 from a minimum digit, and defining digits not less than the Nth bit as high rank bits and digits lower than Nth bit as low rank bits;

judging whether all of the high rank bits of the collected IP addresses are same;

20 if all of the high rank bits are not same, changing N to N+1, N-1, or to a desired number, and sectioning the binary numerals in the step of sectioning to make the judgment at the judgment step;

repeating the number changing step until all of the
25 high rank bits become same;

if all of the high rank bits are same, adopting a value expressed by binary number composed of the same high rank bits and low rank bits set all 0 as IP network address, and adopting a value expressed by binary number composed of high rank bits set all 1 and low rank bits set all 0 as subnet mask; and

selecting an IP address, which is different from the IP address of any the other device connected to the network, from among a group of effective IP addresses defined by the IP network address and the subnet mask.

7. A method of searching and collecting all the addresses already being used in an environment where all packets flowing through network connected by using connecting means such as switching hub and bridge cannot be observed, the method comprising the steps of:

selecting an address other than already posed address to pose that address;

sending a destination signal on network to any device having IP address that does not respond by using the IP address of the posed device, and collecting address of other devices by acquiring responses to the destination signal; and

repeating the selection of the address and sending of the destination signal until the address that is not posed does not exist.

of the device to finish the operation, and when the address resolution request packet is observed then judging whether the MAC address included in the packet is smaller than its own MAC address; and

5 when the MAC address is smaller than its own MAC address then setting the IP address as its own IP address to finish the operation, when the MAC address is not smaller than its own MAC address then selecting another IP address that is intended to use.

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10. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of deciding Internet address of a device to be specified in network connecting a plurality of devices
15 that communicate each other by using an Internet Protocol, the method comprising the steps of:

 detecting and collecting addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network; and

20 selecting an IP address, which is different from the collected addresses, from among a group of applicable IP addresses

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11. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of deciding Internet address of a device to be specified in network connecting a plurality of devices that communicate each another by using an Internet Protocol, the method comprising the steps of:

detecting addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network;

selecting an IP address and a MAC address among the detected addresses to pose as a device having the IP address and the MAC address;

sending a destination signal on the network by using the address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

selecting an IP address, which is different from the collected addresses, among a group of applicable IP addresses.

12. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of selecting an IP address that does not overlap with other addresses among the effective range permitted as IP address, the method comprises the steps of:

detecting and collecting addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network;

sectioning binary numerals of the collected IP address
5 at Nth bit ($1 \leq N \leq K$, K is a predetermined natural number) from a minimum digit, and defining digits not less than the Nth bit as high rank bits and digits lower than Nth bit as low rank bits;

judging whether all of the high rank bits of the
10 collected IP addresses are same;

if all of the high rank bits are not same, changing N to N+1, N-1, or to a desired number, and sectioning the binary numerals in the step of sectioning to make the judgment at the judgment step;

15 repeating the number changing step until all of the high rank bits become same;

if all of the high rank bits are same, adopting a value expressed by binary number composed of the same high rank bits and low rank bits set all 0 as IP network address, and
20 adopting a value expressed by binary number composed of high rank bits set all 1 and low rank bits set all 0 as subnet mask; and

selecting an IP address, which is different from the IP address of any the other device connected to the network,
25 from among a group of effective IP addresses defined by the

IP network address and the subnet mask.

13. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of searching and collecting all the addresses already being used in an environment where all packets flowing through network connected by using connecting means such as switching hub and bridge cannot be observed, the method comprising the steps of:

10 selecting an address other than already posed address to pose that address;

 sending a destination signal on network to any device having IP address that does not respond by using the IP address of the posed device, and collecting address of other devices
15 by acquiring responses to the destination signal; and

 repeating the selection of the address and sending of the destination signal until the address that is not posed does not exist.

20 14. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of limiting address range to be searched in an environment where a wide address space is used, the method comprising the steps of:

25 restricting address in the range to be searched by

using a net mask that has a suitable value; and

repeating search of the address range with use of the net mask of smaller value if all matters to be searched are detected.

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15. A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method for automatically deciding a value of Internet address that is not overlapped in an environment
10 where a plurality of similar IP address deciding devices are used, the method comprising the steps of:

selecting an IP address that is intended to use and its own MAC address;

sending an address resolution request packet using
15 the selected IP address as of transmitter and as requested address;

observing for a predetermined period of time whether or not an address resolution request packet including the identical IP address used as of transmitter and as requested
20 address and a MAC address different from its own MAC address is sent;

when the address resolution request packet is not observed then setting the IP address as its own IP address of the device to finish the operation, and when the address
25 resolution request packet is observed then judging whether

the MAC address included in the packet is smaller than its own MAC address; and

when the MAC address is smaller than its own MAC address then setting the IP address as its own IP address to finish the operation, when the MAC address is not smaller than its own MAC address then selecting another IP address that is intended to use.

16. A device for deciding Internet address of a device to be specified in network connecting a plurality of devices that communicate to each other by using an Internet Protocol, the device comprising:

detecting and collecting unit which detects and collects addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network; and

address selecting unit which selects an IP address, which is different from the collected addresses, from among a group of applicable IP addresses.

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17. The Internet address deciding device according to claim 16, wherein said address selecting unit checks whether the selected IP address matches with the IP address of any of said other devices, and if the selected IP address matches with the IP address of any of said other devices then repeats

the selection of the IP address until the selected IP address does not match with the IP address of any of said other devices.

18. A computer program for causing the computer to perform
5 a method of deciding Internet address of a device to be specified in network connecting a plurality of devices that communicate each other by using an Internet Protocol, the method comprising the steps of:

detecting and collecting addresses of all the other
10 devices connected to the network by receiving and analyzing signals flowing through the network; and

selecting an IP address, which is different from the collected addresses, from among a group of applicable IP addresses

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19. A computer program for causing the computer to perform a method of deciding Internet address of a device to be specified in network connecting a plurality of devices that communicate each another by using an Internet Protocol, the
20 method comprising the steps of:

detecting addresses of all the other devices connected to the network by receiving and analyzing signals flowing through the network;

selecting an IP address and a MAC address among the
25 detected addresses to pose as a device having the IP address

and the MAC address;

sending a destination signal on the network by using
the address of the posed device, and collecting addresses
of other devices by acquiring responses to the destination
5 signal; and

selecting an IP address, which is different from the
collected addresses, among a group of applicable IP
addresses.

10 20. A computer program for causing the computer to perform
a method of selecting an IP address that does not overlap
with other addresses among the effective range permitted
as IP address, the method comprises the steps of:

detecting and collecting addresses of all the other
15 devices connected to the network by receiving and analyzing
signals flowing through the network;

sectioning binary numerals of the collected IP address
at Nth bit ($1 \leq N \leq K$, K is a predetermined natural number)
from a minimum digit, and defining digits not less than the
20 Nth bit as high rank bits and digits lower than Nth bit as
low rank bits;

judging whether all of the high rank bits of the
collected IP addresses are same;

if all of the high rank bits are not same, changing
25 N to N+1, N-1, or to a desired number, and sectioning the

binary numerals in the step of sectioning to make the judgment at the judgment step;

repeating the number changing step until all of the high rank bits become same;

5 if all of the high rank bits are same, adopting a value expressed by binary number composed of the same high rank bits and low rank bits set all 0 as IP network address, and adopting a value expressed by binary number composed of high rank bits set all 1 and low rank bits set all 0 as subnet

10 mask; and

selecting an IP address, which is different from the IP address of any the other device connected to the network, from among a group of effective IP addresses defined by the IP network address and the subnet mask.

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21. A computer program for causing the computer to perform a method of searching and collecting all the addresses already being used in an environment where all packets flowing through network connected by using connecting means
20 such as switching hub and bridge cannot be observed, the method comprising the steps of:

selecting an address other than already posed address to pose that address;

25 sending a destination signal on network to any device having IP address that does not respond by using the IP address

of the posed device, and collecting address of other devices
by acquiring responses to the destination signal; and

repeating the selection of the address and sending
of the destination signal until the address that is not posed
5 does not exist.

22. A computer program for causing the computer to perform
a method of limiting address range to be searched in an
environment where a wide address space is used, the method
10 comprising the steps of:

restricting address in the range to be searched by
using a net mask that has a suitable value; and

repeating search of the address range with use of the
net mask of smaller value if all matters to be searched are
15 detected.

23. A computer program for causing the computer to perform
a method for automatically deciding a value of Internet
address that is not overlapped in an environment where a
20 plurality of similar IP address deciding devices are used,
the method comprising the steps of:

selecting an IP address that is intended to use and
its own MAC address;

sending an address resolution request packet using
25 the selected IP address as of transmitter and as requested

address;

observing for a predetermined period of time whether
or not an address resolution request packet including the
identical IP address used as of transmitter and as requested
5 address and a MAC address different from its own MAC address
is sent;

when the address resolution request packet is not
observed then setting the IP address as its own IP address
of the device to finish the operation, and when the address
10 resolution request packet is observed then judging whether
the MAC address included in the packet is smaller than its
own MAC address; and

when the MAC address is smaller than its own MAC address
then setting the IP address as its own IP address to finish
15 the operation, when the MAC address is not smaller than its
own MAC address then selecting another IP address that is
intended to use.